

**Notice of Allowability**

Application No.

10/057,543

Examiner

N. Bhat

Applicant(s)

KONG ET AL.

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the telephonic communications of March 17, 2005.
2. ☒ The allowed claim(s) is/are 1 and 5-25, re-numbered 1-22 respectively.
3. ☒ The drawings filed on 23 January 2002 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

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1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-25, drawn to an apparatus for direct conversion of hydrocarbons, classified in class 422, subclass 186.
- II. Claims 26-33, drawn to a method of converting hydrocarbons, classified in class 208, subclass 108.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the method can be practiced with a material different apparatus such as using fluidized bed reactors for hydrocracking the hydrocarbons and need not use the dielectric barrier discharge plasma cell and solid oxide membrane apparatus as claimed in apparatus. Further the apparatus can be used for promoting different types of reactions and need not be used solely for the conversion of hydrocarbons.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with Mr. Christian on March 17, 2005 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-25. Affirmation of this election must be made by applicant in replying to this Office action. Claims 26-33 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

7. Action on the merits of claims 1-25 follows:

8. Claims 1-25 are found to be allowable over the prior art.

9. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Christian on March 17, 2005.

The application has been amended as follows:

In the claims:

Claim 1, line, after "there between;" insert --wherein the inner electrode comprises a catalyst material or catalyst material coating;--

Delete claims 2-5

Claim 5, line 1, delete "2" and insert --1--

Delete claims 26-33 without prejudice, applicant reserves the right to file for a divisional application.

10. The following is an examiner's statement of reasons for allowance:

The invention relates to an apparatus for direct conversion of hydrocarbons comprising a dielectric barrier discharge plasma cell comprising an outer electrode and an inner electrode with a dielectric material and a passageway therebetween, the distinguishing feature of the apparatus of the instant invention is that the inner electrode comprises a catalyst material or catalyst material coating; or that the dielectric barrier discharge plasma cell and solid oxide electrochemical cell has in combination a UV light source, the apparatus beside for the dielectric barrier discharge plasma cell comprising and outer electrode and inner electrode with a dielectric barrier and a passageway therebetween includes a solid oxide electrochemical cell in fluid communication with the discharge plasma cell and wherein the electro chemical cell comprises a mixed conducting solid oxide electrolyte membrane tube; a porous anode on an exterior surface of the electrolyte membrane tube; a porous cathode on an interior surface of site from the porous anode; and a gas inlet tube for feeding oxygen containing gas to the porous cathode; an inlet for feeding hydrocarbons to the passageway for the discharge plasma cell; and an outlet for discharging reaction

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products from the electrochemical cell. In a further embodiment a packed bed catalyst is placed in the discharge plasma cell and electrochemical cell.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Amouroux et al. teach a process of hydrocracking a hydrocarbon feed stock, which includes subjecting the hydrocarbon to a fluidized bed reactor wherein the fluidizing gas is subjected to a plasma torch, which is used to ionize hydrogen, which is used as a fluidizing gas.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Bhat whose telephone number is 571-272-1397. The examiner can normally be reached on Monday-Friday, 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



N. Bhat  
Primary Examiner  
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